REMARKS

Claims 38 and 45-61 are pending in the present application. Claims 38 and 45-59 were presented for examination. Claims 60 and 61 were added by amendment.

In the office action mailed July 22, 2003 ("the Office Action"), the Examiner indicated that claims 30-51 are pending in the present application, and that claims 30-37 and 39-44 had been withdrawn from consideration. However, claims 30-37 and 39-44 were cancelled and claims 52-59 were added in the amendment and response filed on May 5, 2003. Thus, only claims 38 and 45-59 were pending at the time the Office Action was mailed. With the addition of claim 60 and 61, claims 38 and 45-61 are currently pending, as previously mentioned. Confirmation by the Examiner of the pending claims in the present application is requested.

Also in the Office Action, claims 38 and 52 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,001,709 to Chuang *et al.* ("the Chuang patent"). Claims 38 and 45-59 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,130,102 to White, Jr. *et al.* ("the White patent"). Note that the White patent was filed on November 3, 1997 and issued on October 10, 2000. The present application was filed on February 13, 2002, but claims the priority of a parent application that was filed on January 26, 2001. Since the White patent issued prior to the filing of either the present application or its parent application, the White patent cannot be prior art under 35 U.S.C. 102(e). However, it appears that the White patent can be prior art under 35 U.S.C. 102(a). As such, based purely on the filing dates of the present application and its parent application, in addressing the Examiner's rejection, claims 38 and 45-59 will be considered to be rejected under 35 U.S.C. 102(a) as being anticipated by the White patent.

The disclosed embodiments of the invention will now be discussed in comparison to the prior art. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the prior art subject matter, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

The present invention includes embodiments directed to processes and devices including selectively formed contacts for electrically interconnecting components on an integrated circuit. The contacts have an increased vertical growth rate relative to a lateral growth

rate during formation of the contacts. In this way, adjacent contacts may be formed in integrated circuits having reduced dimensions of components forming the integrated circuit since the lateral growth rate of the contacts will not cause adjacent contacts to electrically short circuit. Figure 2 of the present application illustrates an overall process of selectively forming contacts 200-204 on a substrate 206 according to one embodiment of the present invention. To begin the process, a selective epitaxial growth (SEG) process is started, causing the contacts 200-204 to begin forming over the regions 214-218, respectively. At the same time, electromagnetic radiation 208, or some other type of directed thermal energy, is applied to begin heating upper surfaces 220 of the contacts 200-204. The radiation 208 heats the upper surfaces 220, causing a vertical growth rate 226 of each contact 200-204 to increase relative to a lateral growth rate 228 of the contact. The lateral growth rates 228 of each contact 200-204 do not increase significantly because the intensity of the radiation on sidewall surfaces 222, 224 is small relative to the intensity on the upper surfaces 220. As a result, the contacts 200-204 grow at a faster rate in the vertical direction 226 than in the lateral direction 228. The relatively smaller lateral growth rate 228 results in less lateral growth of each contact 200-204 during the time the contact is being formed. As a result, the sidewall surfaces 222, 224 are more vertical than the sidewalls of contacts formed according to the conventional process of Figure 1.

The reduced lateral growth rate 228 relative to the increased vertical growth rate 226 enables contacts 200-204 to be selectively formed having a desired height H in semiconductor integrated circuits having reduced lateral spacing between devices. As seen in the example of Figure 2, the reduced lateral growth of the contacts 200 and 202 results in the contacts being formed only slightly over the isolation oxide region 210, while the increased vertical growth rate 226 enables the contacts to be grown to the desired height H. In Figure 2, the surfaces that are significantly heated by the applied radiation 208 are indicated via the thicker lines.

In contrast, neither the Chuang or White patents discuss the application of electromagnetic radiation, or some other type of directed thermal energy, for heating upper surfaces of the contacts. Consequently, claims 38 and 52 are patentably distinct from the Chuang and White patents.

Claim 38 recites an in-process substrate structure including a plurality of contact regions and a plurality of non-contact regions adjacent the contact regions on a surface of the

substrate, the in-process substrate structure comprising a selectively formed contact on each contact region, each contact being isolated from contacts on adjacent contact regions and having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact.

Claim 52 recites an in-process semiconductor structure, comprising a substrate, a plurality of active regions, a plurality of isolation regions adjacent the active regions, each isolation region being positioned between adjacent active regions to isolate adjacent active regions, and at least one selectively formed contact region on each active region, each selectively formed contact region being isolated from contacts on adjacent active regions and having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact.

Claims 38 and 52 are patentably distinct from the Chuang and White patents because the Chuang and White patents fail to teach each limitation of the combination of limitations recited by claims 38 and 52. For the foregoing reasons, the rejection of claims 38 and 52 under 35 U.S.C. 102(b) and (e) should be withdrawn.

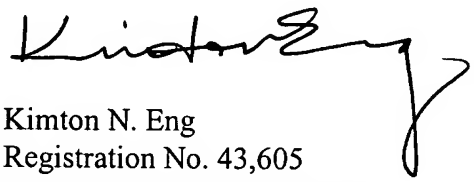
Claims 45-51, which depend from claim 38, and claims 53-59, which depend from claim 52, are also patentably distinct from the White patent based on their dependency from a respective allowable base claim. That is, each of the dependent claims further narrows the scope of the claim from which it depends, and consequently, if a claim is dependent from an allowable base claim, the dependent claim is also allowable. However, because each claim in an application represents a different invention, the rejection of an independent claim does not necessarily result in the rejection of claims depending therefrom. For the foregoing reasons, the rejection of claims 45-59 under 35 U.S.C. 102(a) should be withdrawn.

Claims 60 and 61 have been added by amendment to claim alternative embodiments of the invention described in the specification. No new matter has been added by claims 60 and 61.

All of the claims pending in the present application are in condition for allowance. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

DORSEY & WHITNEY LLP



Kimton N. Eng
Registration No. 43,605
Telephone No. (206) 903-8718

KNE:asw

Enclosures:

Postcard
Check
Fee Transmittal Sheet (+ copy)
Request for Continued Examination

DORSEY & WHITNEY LLP
1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101-4010
(206) 903-8800 (telephone)
(206) 903-8820 (fax)

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